

# PROCEEDINGS OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

## ARSENICAL PARALYSIS.

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On November 2, 1882, at Norristown, Pennsylvania, occurred a series of cases of arsenical poisoning almost without parallel. The poisoning was brought about chiefly through eating pumpkin-pie, which it was subsequently proved contained a large amount of arsenious acid. The story of the tragedy does not come within my province in the present paper.

On the 24th of December, 1882, I saw one of these cases at Norristown with Dr. E. M. Corson, the physician in attendance. On the 3d of January, 1883, he was brought to the Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases, to be under the care of Dr. S. Weir Mitchell. I am indebted to Dr. Mitchell for great courtesy in affording me the opportunity of thoroughly studying the case at the hospital, and now of presenting it to the College.

Dr. G. B. Massey, Electro-Therapeutist and Assistant Physician to the hospital, carefully studied with me the electrical reactions. The results of our examinations will be given at the proper place. Dr. Browning, Resident Physician, also rendered assistance in investigating and recording the case.

H. G., æt. twenty-four, single, a lawyer, prior to Thursday, November 2, 1882, was in good health. He was taken sick immediately after rising from the dinner-table, having eaten freely of the pie which was subsequently found to contain the poison. He had an attack of vomiting which lasted a few minutes only. He had several similar spells of vomiting during the afternoon, and from Thursday night until Saturday morning the vomiting was almost continuous. It then began to subside, ceasing entirely Monday afternoon, except that at two o'clock Tuesday morning he vomited a dark grumous mass. Just before vomiting this mass he had a sensation of constriction or contraction in the muscles of the chest and throat, and the facial muscles were much contorted. He was not purged at any time; in fact, his bowels were not opened from Thursday, November 2d, until Wednesday, November 8th. During the whole time that the vomiting persisted he had but little pain, scarcely more than would be accounted for by the retching and vomiting. Prostration was very great from the first. Tuesday night, November 7th, he attempted to get out of bed, but fainted, and remained for some time in a semi-conscious state. About this period he began to have marked fever.

On Wednesday, November 8th, and therefore six days after taking the poison, the patient noticed for the first time a sensation of aching and numbness chiefly about the knees. The numbness continued, and, in a few days, extended toward his feet. He still, however, had fair use of his legs, although, of course, they were extremely weak. Three days after the appearance of the numbness in his lower limbs the same sensation began in the fingers of both hands, and soon extended to the wrists, beyond which it never passed.

His brain remained unaffected.

His legs below the knees were now almost completely paralyzed, and there was some loss of power below the elbows.

His face was considerably puffed and swollen.

His general condition and his special symptoms remained as just recorded, without any change worthy of note, until December 1st, four weeks after the ingestion of the arsenic, when he began to suffer great pain. The pains began in the knees, and speedily invaded the legs below the knees, and the feet, progressing in the same course as the numbness had previously taken. Aching was always present, but frequently the pains were boring, tearing, or lancinating. They were accompanied by a sensation like that

produced by a strong faradic current. Two days after the coming on of the pain in the legs, the fingers and hands also became the seat of aching. In one week the pains began slowly to abate; but throughout December, and, indeed, up to the present time, he has had more or less pain, varying very much in character. By the middle of December, the numbness and aching, which had previously been below the knees, had extended above them a distance of several inches. His lower extremities felt as if encased in a cylinder, as high as the limits of the numbness. The symptoms in his upper extremities did not change noticeably. The loss of power in the thighs increased with the spreading upward of the sensory perversion.

I will now give the results of my examinations into the condition of the patient. He was first examined by me December 24, 1882, but the notes here given are from examinations made between January 10th and January 17th, 1883, nearly two months and a half after the poisoning.

He presented no brain symptoms, and no disturbances of the special senses of sight, hearing, taste, or smell. He slept fairly well until midnight, and then was usually restless and unable to get into a comfortable position.

He was much emaciated. Wasting of the limbs was extreme. The following measurements were taken:

Circumference of right thigh . . . . .	11	inches.
“ “ left “ . . . . .	10 $\frac{3}{4}$	“
“ “ right calf . . . . .	8 $\frac{1}{4}$	“
“ “ left “ . . . . .	8 $\frac{1}{4}$	“
“ “ right arm . . . . .	7	“
“ “ left “ . . . . .	7	“
“ “ right forearm . . . . .	6 $\frac{1}{2}$	“
“ “ left “ . . . . .	6 $\frac{1}{4}$	“

Paralysis below the elbows was marked, but not complete. The extensors and supinators were most decidedly affected. The fingers could only be flexed about one half. Movements of the thumbs and the small movements of the fingers were impaired. The loss of power was slightly

greater in the right limb than the left. The following were the registerings of the dynamometer :

Right hand	.	.	.	.	.	.	.	.	35
Left	"	.	.	.	.	.	.	.	35

At both elbows were marked contractures at about right angles. The angles could be reduced to about  $160^{\circ}$ , but any attempt to carry the straightening further caused pain in the flexor tendons.

Both legs were paralyzed completely below the knees. All movements of the toes and feet were abolished absolutely.

The legs in their entirety showed a tendency to rotate outward ; the feet, however, assuming the equino-varus position. Contractures were not present at the knees, but at times the limbs would assume a semiflexed position, these acts of flexure being accompanied by cramp-pains in the flexor muscles of the thighs. He had these jerkings both in the legs and arms not infrequently.

The bowels were very torpid, requiring cathartics. Some dribbling of the urine occurred for a few days in the early part of January, and then passed away. For a few days, also, he had some pain, which he referred to the lower part of the urethra, just as the discharge of urine was completed. At the time of examination, January 17th, the urine was passed slowly, but without pain.

The urine showed an excess of phosphates ; but neither albumen nor sugar were present.

Farado-contractility was abolished in all muscles below both knees. Above the knees, the extensor and flexor groups and the sartorius were examined, and the faradic reaction was found to be greatly diminished, but not wholly absent. The response was better to nerve than to direct muscular applications.

The muscles below the knees would not respond to weak galvanic currents. To currents of medium strength they responded, but not normally.

The reactions were those of degeneration. Anodal closing gave the strongest reaction ; cathodal closure came next.

Slight contractions followed both anodal and cathodal opening. The contractions were at first sluggish, though vigorous, increasing after a few trials, and then quickly exhausting. The reactions, expressed in the German formula were :

AnSZ";  
 KaSZ ;  
 AnOZ ;  
 KaOZ.

In both upper extremities farado-contractility was decreased, but not lost ; the diminution was much greater below than above the elbows. Below the elbows the faradic excitability was rapidly exhausted.

To the galvanic current the reactions of degeneration were present, but not so decidedly as in the legs. Anodal closing gave stronger reaction than cathodal. With moderately strong currents tetany was produced at the anode.

Both patellar reflexes were abolished.

The cremaster-reflex was studied, and presented some interesting points. The retraction of the testicle, known as the cremaster-reflex, which has been thoroughly discussed by Dr. S. Weir Mitchell (*JOURNAL OF NERVOUS AND MENTAL DISEASE*, October, 1879), can usually be awakened by irritation of a certain definite region of the thigh extending from the groin nearly to the knee. In young lads, as Dr. Mitchell has shown, this reflex is easily caused by touching or pinching the whole thigh, with the exception of a band of skin which nearly always may be represented as forming the postero-lateral third of the circumference of the thigh. Sometimes, however, the cremaster-reflex region is far less and sometimes far more extensive. It rarely extends below the knees, although, as stated by Dr. Mitchell, it may in the healthy boy include a large part of the calf of the leg. In adults the excitor region is often much restricted, and it may even be absent.

Gentle irritation of the skin of the inner aspect of the right thigh and leg of the patient, as far down as the malleolus, caused very vigorous retraction of the right testicle. Sometimes, but not usually, both testicles were retracted.

Similar irritation of the left thigh and leg led to movement of the left testicle, which was marked, but not as vigorous as that exhibited by the right from irritation of the right limb. Now and then, in making this test, the unilateral movement of the left testicle, from irritation of the left thigh and leg, was followed a moment later by an imperfect retraction of the testicle of the opposite side. A similar effect was not produced in any of my examinations by irritation applied to the right limb; neither did excitation of one side cause motion in the other side only.

Dr. Mitchell says: "As a rule, which has infrequent exceptions, irritation of one side produces unilateral movement of the testicle of the same side. There are two forms of violation of this law. In the first, irritation of one thigh causes motion of the testicle of the same side, and also, a moment later less complete action of the testicle of the opposite side. In the other case, touching or pinching certain parts of the inner, and usually of the lower, half of the thigh, causes reflex cremaster motion on the other side only; while like irritation in other parts higher up give rises only to unilateral activity on the same side."

On admission the surface temperature of each calf was 95° F. He usually complained of his legs feeling to him unduly warm.

Late in November transverse white bands were observed across the finger nails about two lines from their posterior limits. The nails were not furrowed, but simply showed white markings. As the nails have slowly grown these lines have remained.

The fingers and forearms were hyperæsthetic, but at the same time the patient could not determine with any accuracy as to one or two points on testing him with the æsthesiometer. A similar condition, but more marked, was present in the feet, legs, and as high as the middle of the thighs. The muscles were very sensitive.

Applications of hot and cold water were discriminated readily.

I will give the record of pulse, respiration, and temperature, for two weeks, from January 9th to 23d.

	PULSE.		RESPIRATION.		TEMPERATURE.	
	Morning.	Evening.	Morning.	Evening.	Morning.	Evening.
Jan. 9		107		26		99° F.
" 10	134	140	24	24	98.4° F.	99.2
" 11	134	132	24	24	98.6	98.6
" 12	136	132	24	24	98.8	99.1
" 13	140	128	28	24	98.6	98.8
" 14	140	138	24	28	99.8	98.8
" 15		140		24		98.4
" 16	136	128	24	24	99	98.8
" 17	148	128	24	28	98.8	99.6
" 18	136	124	24	24	99	99.8
" 19	132	116	24	20	98.4	98.6
" 20	124	116	24	24	98.6	98.6
" 21	130	116	24	24	97.8	98.6
" 22	128	120	24	24	98	98.8
" 23	124	136	24	25	99	99.4

The pulse, therefore, during the time of these observations, ranged between 107 and 148, and was nearly always more rapid in the morning than in the evening.

The respirations ranged between 20 and 28, standing usually at about 24.

The temperature ranged between 97.8° F. and 99.8° F., but commonly was not much either way from the normal.

On admission to the hospital the following treatment was instituted by Dr. Mitchell: Applications of ice and hot water alternately were made three times daily for ten minutes at a time to his arms and legs from the elbows and knees downward. Surface massage with cocoa-nut oil was used once daily. Ice-bags were applied to the spine for one to two hours twice daily. One grain of the extract of ergot of the new United States Pharmacopœia was given every two hours, and this was rapidly increased until thirty grains daily were administered. After continuing the use of the ergot for a week the patient's stomach became disordered, and tincture of belladonna in doses of five drops every three hours was substituted. Fifteen grains of chloral were administered occasionally, and sulphate of morphia, at first  $\frac{1}{2}$ th grain, and eventually increased to  $\frac{1}{16}$ th grain, was ordered, to relieve pain when necessary.

He was placed on the ordinary full diet of the hospital,

with the addition of milk three times daily and beef tea twice daily.

I made an examination of the patient to note the effects of treatment to-day (February 7th). He has improved steadily day by day. His general strength has increased. He has regained almost entirely the use of the muscles above the knees. He has also much better use of his fore-arms and hands, particularly the latter, being now able to pick up small objects. The "wrist-drop" has improved greatly. He has much less pain, aching, and numbness below the knees; the legs below the knees, however, still remain paralyzed, but are not so completely helpless. He has every appearance of progressing steadily to recovery.

Having presented this case as fully as possible, I will give in a few words all the information I have been able to obtain as to paralysis and other nervous symptoms shown by the other victims of the poisoning.

Six others altogether, besides our patient, were poisoned. One of these was a little boy, four years old, I. S., to whom a piece of the fatal pie was given as a reward for going on an errand. He died within ten hours, and I have no knowledge of observations as to paralysis or other manifestations of involvement of the nervous system. Probably his death occurred too soon to allow any such observation to be made.

M. S., a sister of the little boy, ate a very little of the pie, and suffered to some extent, but not seriously.

C. H. G., the father of the patient, died November 8th, six days after the ingestion of the arsenic. Besides severe gastro-intestinal symptoms, he suffered with pain in his head, back, and limbs, was delirious for some hours, and was almost completely paralyzed.

Mrs. G., mother of the patient, ate a little of the pie, November 2d, and had an attack of vomiting. On the 4th she ate a piece of custard, which was also found to contain arsenic, and was attacked with vomiting. A few days later weakness of the legs, with aching and numbness, came on, and the right foot and leg became swollen and inflamed. She gradually recovered.

Mrs. V. ate a mouthful or two of the pie and custard containing the arsenic, and suffered with vomiting, etc., for three days. She has since had paresis and paræsthesia of the legs.

Mrs. F., who ate freely of the poisoned food, suffered severely



from gastro-intestinal symptoms. She is now under the professional care of Dr. H. N. Umstead, of Yerkes P. O., Montgomery Co., Pa., who has courteously written to me about her condition, and the substance of whose communication I will give. Dr. Umstead states that Mrs. F. has been paralyzed from the elbows to the ends of her fingers, and from the knees to the toes. She complained of numbness and coldness in the limbs, and a feeling as if a cord was tied tightly around the waist. She had extreme pain in the paralyzed extremities. She has greatly improved, is riding out daily, can stand without aid, and can even walk a little with assistance. She still has some pain in the hands and in the soles of the feet, but they are not tender to the touch. She has some anæsthesia of the hands and feet, especially of the latter. She begins to enjoy her food, for which at first she had great loathing. Her bowels are moved once, and she urinates twice, daily, but has not quite the natural sensation when the bowel or bladder is evacuated. Dr. Umstead states that Mrs. F. and Mrs. V., whom he also treated, make five cases of arsenical paralysis which have fallen under his care during his professional career.

A careful analysis of the history and symptomatology of the case detailed must compel me to conclude that in well-marked arsenical paralysis we have to deal with a diffused myelitis; decided motor, trophic, and sensory bilateral phenomena being present.

With the assistance of Dr. J. H. Lloyd, one of the staff of the nervous dispensary of the University Hospital, I began the preparation of a *résumé* of the literature of arsenical paralysis, when the JOURNAL OF NERVOUS AND MENTAL DISEASE for October, 1882 (edited by William J. Morton, M.D., of New York), containing an admirable article on the subject by Professor E. C. Seguin, came to hand. In this paper the literature of the subject is given with considerable fulness, and to it I would refer those interested.

Beginning with Abano, who flourished as early as the thirteenth century, the authorities quoted or referred to by Professor Seguin are Forestus, Zacchias, Hahnemann, Thilenius, Brodie, Orfila, Christison, Graves, Huss, Leroy d'Étiolles, Imbert-Gourbeyre, Smoler, Jaccoud, Seeligmüller, Popow, Rosenthal, Romberg, Erb, Hammond, and Da Costa.

I will refer here only to the observations of Christison and Popow. Christison describes two classes of cases of arsenical poisoning in which the victims die early without paralysis, and a third class of what he terms subacute cases, with moderate gastro-intestinal inflammation. "In the latter stage these cases are apt to show marked nervous symptoms: coma, epileptoid attacks, mania, tetanus, hysterical seizures, partial paralysis resembling lead, paralysis in affecting the extremities; contractures may exist."

In 1881, Popow, of St. Petersburg, published an essay on the pathological anatomy of arsenical paralysis as produced artificially in animals. The work of Popow was carried on under the guidance of the distinguished neurologist and microscopist, Professor Mierzejewski, and Seguin considers his essay as in many respects the most important contribution yet made to the subject. Popow concludes that arsenic, even in a few hours after its ingestion, may cause acute central myelitis or acute poliomyelitis; that in chronic cases pathological changes are found in the white as well as in the gray substance, constituting a diffused myelitis, and that the peripheral nerves remain normal, even three months after intoxication. Seguin gives condensed accounts of a few of the cases reported in the literature of the subject, and also reports three cases of his own, all would-be suicides with Paris green. His conclusions are practically the same as those of Popow. According to Seguin, whether the myelitis is strictly arsenical, *i. e.*, caused by the direct effect of the arsenic on the tissue of the spinal cord, or whether it is produced (as are many forms of myelitis) by the irritation of peripheral nerves (cutaneous, intestinal, and gastric nerve-endings), is a question which cannot at present be definitely solved, but which presents an interesting field for future research and speculation.

Dr. Lloyd has collected the following references to authorities and cases in addition to those cited by Seguin:

Beck ("Elements of Medical Jurisprudence," sixth edition, vol. ii, 1838) gives three classes or varieties of arsenical poisoning. In the third variety there is, first the inflammatory action; then, when this recedes, comes the second stage, that of nervous involvement. The nervous symptoms vary

"from coma to an imperfect palsy of the arms and legs, and between these extremes are observed epileptic fits or tetanus."

[Taylor ("On Poisons," etc., 1848) gives several cases where the symptoms of *narcotism* (or general paralysis of the nervous system) were marked.

A man swallowed, by accident, some arsenic early in the morning. He went to work for several hours afterward; and was then gradually observed to sink into a drowsy state, and died that night with no complaint of pain.

A child, aged two and a half years, died *narcotized* two hours after taking the poison.

Wharton and Stillé ("A Treatise on Medical Jurisprudence," second and revised edition, 1860) make mere mention of palsy as a symptom which is apt to occur late in the case.

Taylor ("A Manual of Medical Jurisprudence," seventh American edition, 1873) speaks of local paralyses, preceded by numbness or tingling in the fingers and toes, as common consequences of chronic arsenical poisoning.

According to Stillé ("Materia Medica and Therapeutics," 4th ed., vol. ii, 1874, p. 816), arsenical paralysis most frequently affects the lower limbs first, extending gradually to the arms; but it is more permanent in the legs, continuing for months or even years. It is accompanied with cramps, spasmodic movements, numbness, and formication. The cutaneous sensibility is impaired, and the patient generally complains of coldness in the parts affected.

H. C. Wood ("A Treatise on Therapeutics," etc., second edition, 1876) speaks of paralysis, which follows non-fatal cases, and affects preferably the lower extremities, commencing and remaining longest in them; does not select the exterior muscles, and is almost always accompanied by anæsthesia, or at least by numbness and formication, and by coldness of the extremities. He quotes experiments on frogs; mostly from Sklarek.

Ringer ("Hand-Book of Therapeutics," ninth edition, 1883) refers to his experiments on frogs. He found paralysis of sensation, reflex action, and voluntary motion. He believes that the paralyzing action is exerted on the cord first, then

on the nerves, and last on the muscles. The difference may be noted between Ringer and Seguin, that Ringer does not refer all pathological changes to the cord. He regards the arsenic as a "protoplasmic poison," affecting all tissues. He says that frogs are sometimes only apparently paralyzed; *i. e.*, sensation is lost, and hence there is no response to external irritants, but if laid on their back, they turn themselves over.

"The Index-Catalogue of the Surg.-Genl.'s Office" gives the titles of forty-three books on the physiological and therapeutic effects of arsenic, but nothing special on its paralyzing effects.

Gibb (Neuralgia and Paraplegia, Supposed to be Due to Long-Continued Use of Arsenic, etc., *Trans. Path. Soc. Lond.*, ix, p. 442) records the case of a lady who had taken arsenic, mostly Fowler's solution, for many years for a skin affection. She had attacks of acute neuralgia in groins, shoulders, and sides. These pains were considered due to arsenic by Sir Jas. Clark, Dr. Robert Lee, and Dr. Copland, who all saw the case. Afterward she lost all power over her lower limbs, which felt numb, although sensibility remained perfect. This retention of sensibility is at variance with other observers and experimenters. After death the abdominal and thoracic glands were found enlarged, and traces of arsenic were found in the liver and in the lumbar vertebræ, although the drug had not been taken for more than seven months before death.

Colton (Arsenical Paralysis, *N. Y. Journ. of Med.*, September, 1850, pp. 177, 178) mentions the case of a patient who swallowed, accidentally, some arsenic, and was admitted to the hospital under Dr. Colton's care. The primary effects of the poison had been successfully combated with proper remedies. Seven days afterward, when feeling quite well, he was attacked with violent cramps in index finger of the right hand, spreading to other fingers, then to other hand, and finally to the feet. The pain in hands subsided as the feet became affected. The cramps lasted thirty minutes. He then fell into sound sleep, it being night, but in the morning he found to his surprise that he had lost the use of the affected parts. This paralysis had

continued unchanged for five months. There was also a feeling of heat and numbness in the arms from the fingers to a little below the elbows, and in the legs from the toes to a little below the knees. Lancinating pains also occurred in those parts daily from 5 P. M. to midnight. He improved slowly under the use of quinia, strychnia, and electricity.

MacCready (Death from External Application of Arsenic, *Am. Journ. Med. Sci.*, July, 1851, p. 259) relates that a woman rubbed white arsenic mixed with gin on the head of her child suffering with favus. The child died in less than forty-eight hours with its legs completely paralyzed.

MacLagan (On the Arsenic Eaters of Styria, *Edinb. Med. Journ.*, 1864, p. 200) visited Styria in the year 1864, and had personal interviews with two "arsenikophagites"; one of whom ate in his presence nearly five grs. of arsenious acid, and the other nearly six grs. The urine of both of these men was carefully bottled and taken back to Great Britain, where a chemical examination revealed arsenic. The physiological effects on these toxicophagi are described as being only tonic and stimulant, especially improving the wind and increasing sexual desire. MacLagan's evidence is strong, yet perhaps not such as would be received in a court of justice, as the men were not kept continuously under observation. The point of chief interest is that he says nothing about paraplegia or any acute or chronic poisoning symptoms among these arsenic eaters.

Dr. Lloyd has called my attention to a case, not before reported, of suicide with arsenic, which happened some years ago in Bucks County, and was under the care of the late Dr. Hendrie. Anæsthesia and paralysis were so marked that the man declared that his legs were cut off, and died in that belief.

After the reading of the paper, Dr. S. WEIR MITCHELL asked if the urine had been examined with care in the early stages of the case? Of late there had been no evidence of trouble, and if at a former period there was albumen it was no longer present.

Perhaps it was not known to all the Fellows that arsenic, in medicinal doses, was in rare cases, as Dr. M. pointed out many years ago, the cause of more or less albuminuria.

As concerned diagnosis, Dr. M. had always looked on these grave forms of paralysis from arsenic as due to myelitis, and saw much in this case to support and nothing to oppose this opinion. Among the symptoms on which the author of the paper had dwelt least were the frequent twitches of the limbs especially in sleep, and the intense general tenderness of the muscles, which disappeared readily under the use of massage.

The pearly tinted band on the nails, about one line wide, had not the slightest indentation, and was unlike any thing in the way of an indication of arrest of nail growth which has ever come to Dr. M.'s attention.

Dr. ROBERTS BARTHOLOW said that these forms of arsenical poisoning, affecting the nervous system, as described in the very interesting paper by Dr. Mills, present many remarkable features. It has long been known that there are cases in which profound depression of the nervous centres, coma, and insensibility have been caused by large doses of arsenic, without any local irritation—without gastro-intestinal inflammation. On the other hand, Virchow informs us that there are cases of acute arsenical poisoning which cannot be differentiated either in respect to the symptoms observed during life or in the morbid anatomy from the algid stage of cholera. The author of the paper did not refer to the fatty degeneration of the intima of the vessels, or to the same change occurring in the epithelial structures of various organs, but he gave an account of the other changes, all of which show the profound alterations to which the tissues of the body in general are subjected, and which tend to prove the correctness of Ringer's view, that arsenic is a protoplasmic poison, and as such, leaves no part of the organism untouched. There is doubtless a community of actions amongst the poisonous metals, and all affect the system to a less or greater extent in the same way. The metals are so largely employed in trades and in domestic life in our day, that many cases of obscure nervous diseases may have their origin in this way. In respect to the treatment pursued, he would have directed more attention to securing elimination of the poison. However, on this point it must be admitted

that the time during which elimination can be effected is rather short. The chemists tell us that if, in a fatal case of arsenical poisoning, the patient lives a week after the poison has been swallowed, its detection may be impossible, so rapidly is it eliminated.

In reply to Dr. Bartholow, Dr. MITCHELL said the time for attempts at elimination had passed, as two months had elapsed between the poisoning and the patient's admission to the hospital.

Dr. S. W. GROSS asked whether any observations had been made with regard to the genital functions in the case reported.

Dr. J. T. ESKRIDGE said that the lecturer had not referred to changes in the blood in acute arsenical poisoning. Brodie, quoted in Stillé's work on "*Materia Medica and Therapeutics*," observed a fluid condition of the blood in animals poisoned by arsenic. He called attention to the fact, because it was another proof of the profound devitalizing influences of the drug when taken in toxic doses.

Dr. MILLS, in reply to the questions which had been asked, stated that there was impairment of the genital functions, but that sexual desire and evidences of sexual power were present. So far as he knew, the urine had not been examined in the early stages of the case. Efforts were made by Dr. Corson, under whose care the patient came, to eliminate the poison by cathartics. When he saw the patient first, the time had passed to derive much benefit from this plan of treatment. Iodide of potassium was administered.